XAV2501 Powerline
Powerline AV+ 200 Adapter
User Manual

NETGEAR®

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Voluntary Control Council for Interference (VCCI) Statement

This equipment is in the Class A category (business use only) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential areas. When used near a radio or TV receiver, it may become the cause of radio interference. Read instructions for correct handling.

FCC Statement

- The XAV2501 has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules.
- Operation is subject to the following two conditions:

  (1) This device may not cause harmful interference, and

  (2) This device must accept any interference received, including interference that may cause undesired operation.
- These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna
  - Increase the separation between the equipment or devices
  - Connect the equipment to an outlet other than the receiver's
  - Consult a dealer or an experienced radio/TV technician for assistance

Canadian Department of Communications Industry Canada (IC) Notice

- This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Europe – EU Declaration of Conformity CE

- A printed copy of the EU Declaration of Conformity certificate for this product is provided in the XAV2501 product package.
- Visit the NETGEAR EU Declarations of Conformity website at: http://kb.netgear.com/app/answers/detail/a_id/11621/sno/0

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About This Manual

The ***NETGEAR® XAV2501 Powerline AV Ethernet Adapter User Manual*** describes how to install, configure and troubleshoot the XAV2501 Powerline AV Ethernet Adapter.

Conventions and Formats

The conventions, formats, and scope of this manual are described in the following paragraphs:

Typographical Conventions. This manual uses the following typographical conventions:

Italic	Emphasis, books, CDs, file and server names, extensions
Bold	User input, IP addresses, GUI screen text
`Fixed`	Command prompts, CLI text, code
italic	URL links

Formats. This manual uses the following formats to highlight special messages:

Note: This note highlights information of importance or special interest.

Tip: This note highlights a procedure that will save time or resources.

Warning: This note warns against a malfunction or damage to the equipment.

Danger: This safety warning warns against personal injury or death.

Revision History

Part Number	Version Number	Publication Date	Description
202-10590-01	1.0	December 2009	XAV2501 Powerline AV+200 Adapter User Manual First publication.

Chapter 1
Installation and Basic Configuration

This chapter describes how to install and configure the XAV2501 Powerline AV+ 200 Adapter. It also explains the security features and how to customize the encryption key for added security.

How the Powerline AV Ethernet Adapter Fits in Your Network

You can use one or more XAV2501 Powerline AV+ 200 Adapters to extend your Ethernet network anywhere in your house using your existing electrical power lines. The illustration below (Figure 1-1) shows an example of a Powerline network using a single Powerline device, which is connected to an Ethernet network:

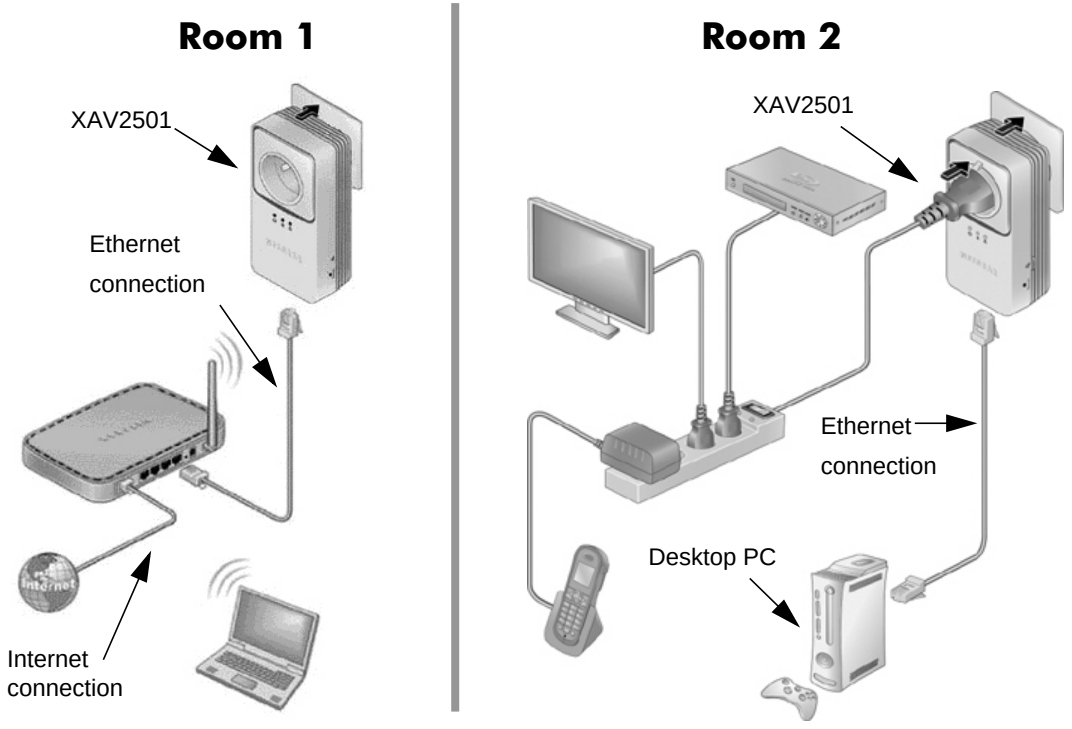


Figure 1-1 Powerline Adapter Connected to an Ethernet Network

Powerline AV+ 200 Adapter Features

The illustration below (Figure 1-2) shows the front and side panels of the Powerline AV+ 200 Adapter:

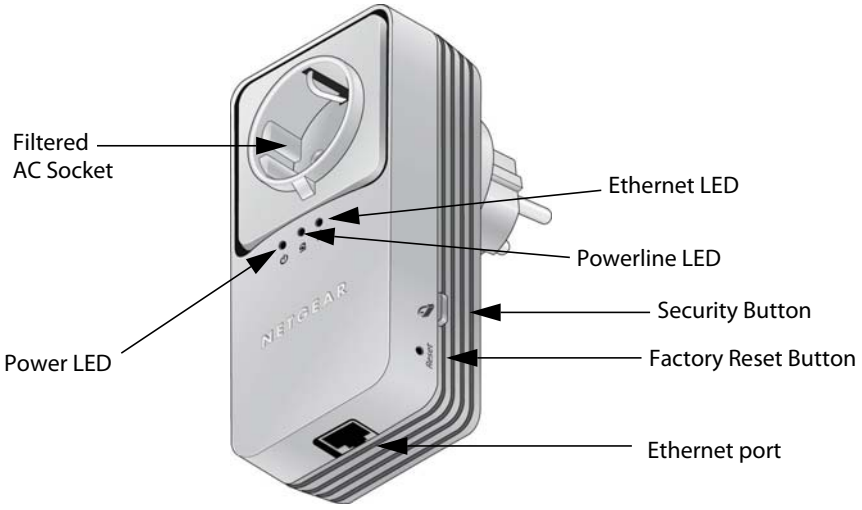


Figure 1-2 XAV2501 Powerline AV+ 200 Adapter - European (Type F)

XAV2501 Label

The label on the back of the XAV2501 contains the following information.

- Model number
- MAC address
- Device password
- Serial number

Depending on the country, your adapter may look like one of these:

LED and Feature Descriptions

The following table describes the buttons, status lights, and Ethernet port on the XAV2501 Powerline AV+ 200 Adapter.

Table 1-1. XAV2501 Feature Descriptions

Item	Description		
Power LED	• **Solid green**. The electrical power is on. • **Blinking green**.The adapter is in the process of restarting or setting up security. • **Amber**. Power saving mode. The unit enters power saving mode if the Ethernet port is not linked for more than 10 minutes. • **Off**. There is no electrical power, or has been turned off through the NETGEAR Powerline Utility.		
Powerline LED	• **Solid**. The adapter is connected to a Powerline network. • **Blinking**. The adapter is sending or receiving data. • **Off**. The adapter has not found any other compatible Powerline devices using the same encryption key, or has been turned off through the NETGEAR Powerline Utility.		
	The **Pick A Plug** feature lets you pick the electrical outlet with the strongest link rate, indicated by the color displayed by the LED:		
	Green: Link rate > 80 Mbps Good for HD video	**Amber**: Link rate > 50 and < 80 Mbps Good for SD Video	**Red**: Link rate < 50 Mbps Good for data
Ethernet LED	• **Solid**. The Ethernet port is linked, but there is no activity. • **Blinking**. There is traffic on the Ethernet port. • **Off**. There is no Ethernet connection, or it has been turned off through the NETGEAR Powerline Utility.		
Factory Reset	Press the Factory Reset button for 1 second, then release to return the Powerline adapter to its factory default settings.		
Security Button	After you plug in your new AV adapters, press the Security button for 2 seconds on both of the AV adapters. Both buttons must be pressed within 2 minutes. **Note**: The Security button does not work in power saving mode. The unit enters power saving mode if the Ethernet port is not linked for more than 10 minutes.		
Filtered AC Socket	The filtered AC socket can remove some electrical noise which may affect powerline performance. Plugging the power plugs of nearby devices into the filtered AC socket may improve performance.		
Ethernet Port	Plug one end of the Ethernet cable that comes with the XAV2501 Powerline AV+ 200 Adapter into this port and the other end either into your router, or into the computer or other peripheral devices.		

Installing Your Powerline AV Ethernet Adapter

Prepare for installation:

1. Before you begin, verify the following:

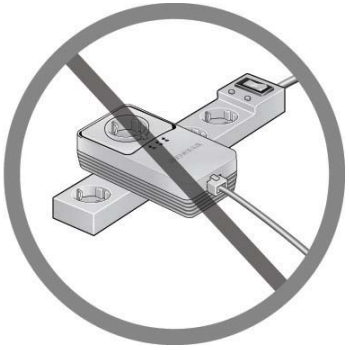
- Your Ethernet network is set up.
- An Ethernet port is available on your router.
- Your Internet connection is working.
- An Ethernet port is available on each computer that will use a Powerline AV+ 200 Adapter and is configured to work on your network.

2. Familiarize yourself with your Powerline AV+ 200 Adapter.

The front panel has three lights: Power, Powerline, and Ethernet. The side panel has a Security button, and a Reset button. The Ethernet port is located on the bottom of the adapter for North America version and on the top for United Kingdom and France versions. See Figure 1-2 on page 1-2.

3. Plan the location of your Powerline devices:

- Use an electrical outlet that is not controlled by a wall switch to avoid someone unknowingly turning off the power to the outlet.
- Do not connect the Powerline AV+ 200 Adapter to a power strip, extension cord, or surge protector as this might prevent it from working correctly, or reduce the network performance.
- Avoid using the Powerline AV+ 200 Adapter in an electrical outlet that is located near an appliance that uses a lot of power, such as a washer or dryer, or a refrigerator. This could potentially prevent the adapter from working correctly, or reduce network performance.



Connecting a Powerline AV Ethernet Adapter to the Router

1. Plug a Powerline AV+ 200 Adapter into a power outlet near your router.

   Use the supplied gray Ethernet cable to connect the Powerline Adapter to a LAN port on your router so that the Powerline network can gain access to the Internet. The Power and Ethernet lights on the Powerline AV+ 200 Adapter should turn on.

	Note: It is *not* necessary to disconnect your router from your computer.

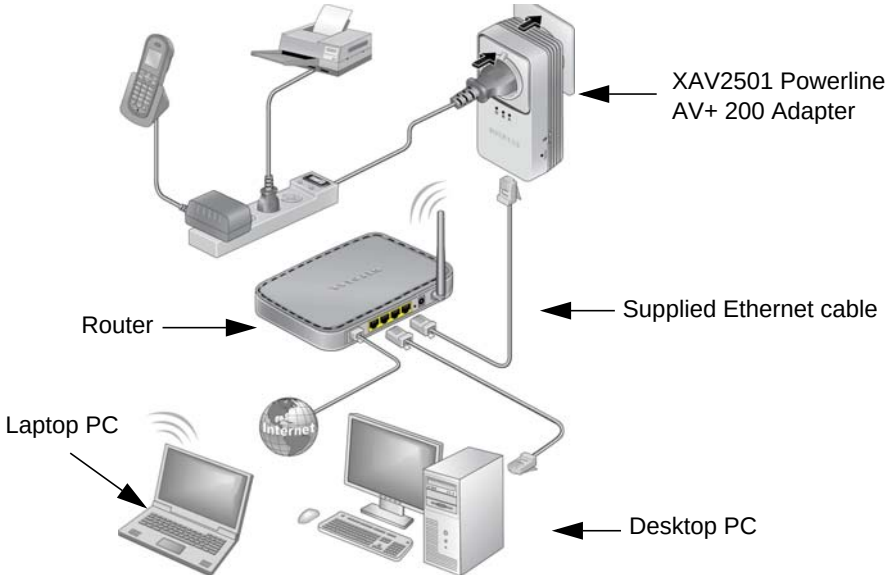


Figure 1-3 Connecting the XAV2501 to a Router

2. Once plugged in and power is first applied, check to see that the Power light is on.
3. After approximately 10 seconds, check to see that:
   a. The Power light is solid green.
   b. The Powerline LED is lit if there is an existing Powerline AV adapter with the same encryption key in the electrical power line.
   c. The Ethernet light is on or blinks.

Adding Adapters to Your Network

Once the first adapter is installed and connected to your router, you can easily add adapters into your network.

To add adapters:

1. Be sure the first adapter is connected to your router. See "Connecting a Powerline AV Ethernet Adapter to the Router" on page 1-5.
2. Plug additional Powerline AV+ 200 Adapters into power outlets near the other computers and additional peripheral devices to be included in your Powerline network.
3. Use the gray Ethernet cable from the XAV2501 package to connect the Powerline AV+ 200 Adapter to an Ethernet port located on the other computers or peripheral devices.
4. Wait for each Powerline AV+ 200 Adapter to be recognized by the Powerline network.

   When recognized, the Power, Ethernet, and Powerline lights will turn on. This could take as little as 5 seconds, up to 80 seconds. For details about how the lights work, see Table 1-1 on page 1-3.
5. Check to make sure that each computer connected to a Powerline AV+ 200 Adapter can access the Powerline network.

   To check that each computer can access the Powerline network, open a browser from each computer to be sure you can access the Internet. If there is a problem, see "Connecting a Powerline AV Ethernet Adapter to the Router" on page 1-5.

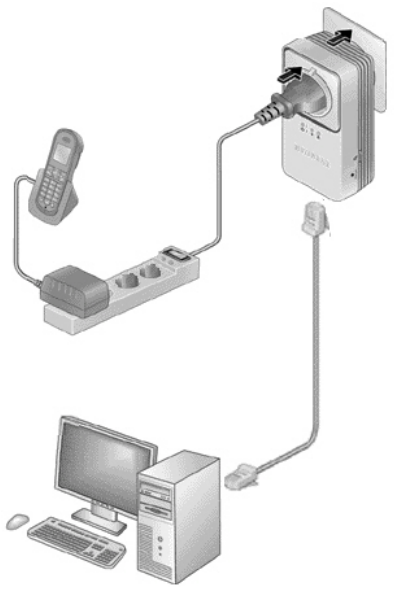


Figure 1-4 Add an adapter

You can also check by installing the NETGEAR Powerline Utility and use it to view all the computers connected by the Powerline AV Ethernet adapter. See "Installing the NETGEAR Powerline Utility" on page 2-2.

	Warning: NETGEAR recommends that you secure your Powerline network from unauthorized access. This is especially relevant in settings such as apartment buildings. See "Understanding Powerline Network Security" on page 1-7.

Understanding Powerline Network Security

A Powerline network consists of two or more Powerline adapters using the same encryption key. Securing your network is crucial. By encrypting the information you send over the Powerline AV Ethernet Adapter, you help to keep it secure from hackers. If you do not set up security, the XAV2501 adapter encrypts the Powerline packets by default encryption key, "HomePlugAV". This is especially important in places where people live close to one another, such as apartment buildings, office buildings, and dorm rooms.

Powerline devices connected to the same network must use an identical encryption key. The security used by Powerline AV Ethernet Adapters is similar to the SSID and encryption keys used in wireless networks, but you do not need software to configure Powerline AV Ethernet Adapters.

There are two ways to secure your Powerline network.

- Use the Powerline AV+ 200 Adapter Security button located on the adapter to automatically generate a random encryption key. See “Changing the Default Encryption” on page 1-8.
- Use the NETGEAR Powerline Utility to configure your Powerline network with an encryption key that you specify. If you are already using Powerline or HomePlug devices then you will need to use the NETGEAR Powerline Utility. If not already installed, the NETGEAR Powerline Utility is located on your *Resource CD*, and should be installed on your computer. See “Security” on page 2-9.

  For information about using the XAV2501 NETGEAR Powerline Utility to configure Powerline security or to prioritize Powerline network traffic using the Quality of Service (QoS) feature, see Chapter 2, “Using the NETGEAR Powerline Utility.

Note: To return the XAV2501 Powerline AV+ 200 Adapter to its factory default settings, see “Resetting to Factory Defaults” on page 2-16.

Changing the Default Encryption

You can use the security button to change the default encryption key and set a private encryption key instead. The default encryption key is **HomePlugAV**.

To set a private encryption key:

1. Verify that all the Powerline AV+ 200 Adapters to be configured are plugged in.

> **Warning:** Do not press the Security button on the Powerline adapter until installation is complete and all adapters on your network are plugged in and communicating with each other. Pressing the Security button too soon can temporarily disable Powerline communication. If this should occur, reset the Powerline adapter to its factory default settings. See "Resetting to Factory Defaults" on page 2-16.

2. On the first Powerline AV+ 200 Adapter, press its security button for 2 seconds.

   The power LED will start blinking after you release the button.

   The adapter will automatically produce a new, randomly generated network encryption key that each Powerline AV+ 200 Adapter will use.

   At this point, the other adapters in your network cannot communicate with each other.

3. Within 2 minutes of pushing the security button on the first adapter, push the security button on the second adapter for 2 seconds.

   Both buttons must be pushed within 2 minutes.

   This securely configures your Powerline network with the same network encryption key.

4. If your network has more than 2 adapters, push the security button on the additional adapter for 2 seconds, then push the security button on any adapter in your existing network for 2 seconds. Both buttons must be pushed within 2 minutes. The adapters retain security settings even if they are unplugged.

> **Note:** An adapter can only generate a private key once. To replace a private key, first reset the adapter back to its factory defaults, then follow the procedure above. See "Resetting to Factory Defaults" on page 2-16.

Chapter 2
Using the NETGEAR Powerline Utility

This chapter explains how to install and use the NETGEAR Powerline Utility. The NETGEAR Powerline Utility is used for all Powerline AV products. All Powerline AV products (XAV101, XAV1004, XAV2001, XAV2501, and XAVN2001) are compatible and can be installed on the same powerline network.

The NETGEAR Powerline Utility can be used to:

- configure encryption for your Powerline network
- perform diagnostics and monitor performance
- set quality of service (QoS) features to prioritize Powerline network traffic
- reset adapters to factory default settings

Installing the NETGEAR Powerline Utility

This utility allows you to set your own unique Powerline network encryption key, and prioritize traffic passing through your Powerline network.

To install the NETGEAR Powerline Utility:

1. Insert the *Resource CD* into a CD drive on the computer that is connected to your router[1].

   The CD automatically starts and displays the following screen:

Figure 2-1

   If the *Resource CD* does not start automatically:

   - Go to **My Computer** on the Windows Start menu, and double-click the drive that represents the location of the *Resource CD* or
   - Select the CD drive, and click the **Autorun.exe** executable file.

1. All devices on a Powerline network can be managed from one computer. If you add another Powerline AV+ 200 Adapter to a Powerline network, you can install the NETGEAR Powerline Utility on the computer connected locally to the new adapter, or open the utility on the computer originally used to set up the Powerline network encryption key. You can use any computer to manage the network, but this procedure assumes that you are working from the computer that is connected to a powerline adapter.

2. Click **Install Software**.

   a. Check for Updates: Click this option to be sure you have the most current software.

   b. Install from CD: Click this option to install the NETGEAR Powerline Utility from the CD.

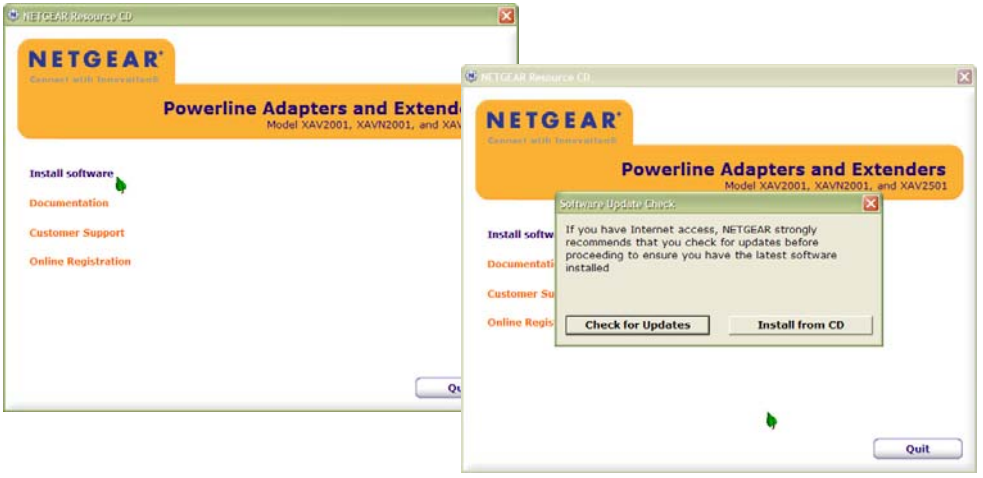

NETGEAR
Powerline Adapters and Extend
Model XAV2001, XAVN2001, and XAV
Install software
Documentation
Customer Support
Online Registration
NETGEAR
Powerline Adapters and Extenders
Model XAV2001, XAVN2001, and XAV2501
Software Update Check
If you have Internet access, NETGEAR strongly recommends that you check for updates before proceeding to ensure you have the latest software installed
Check for Updates
Install from CD
Quit

Figure 2-2

3. Click **Continue**, and follow the wizard prompts.

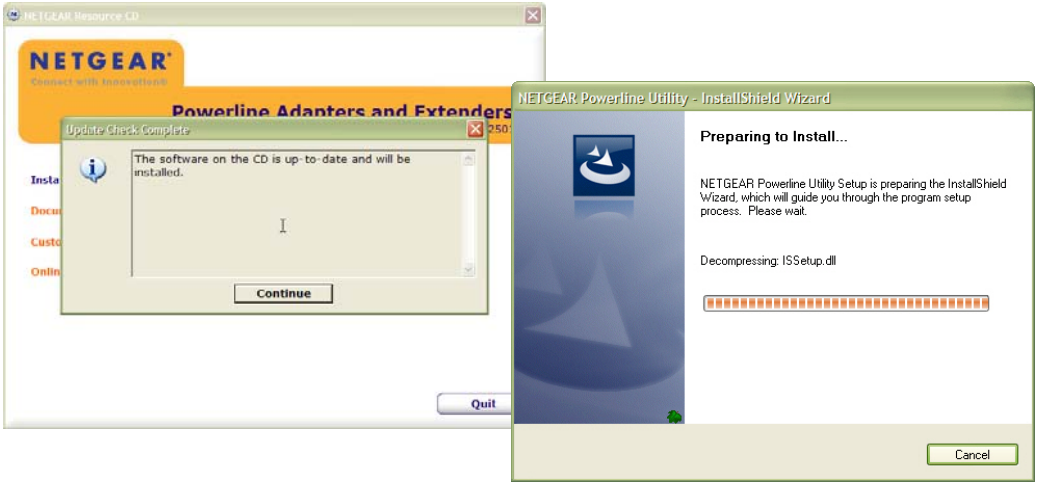

NETGEAR
Update Check Complete
The software on the CD is up-to-date and will be installed.
Continue
Quit
NETGEAR Powerline Utility - InstallShield Wizard
Preparing to Install...
NETGEAR Powerline Utility Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Decompressing: ISSetup.dll
Cancel

Figure 2-3

4. Click **Next** on the Setup Screen, and click **Finish** when the wizard is done.

   The NETGEAR Powerline Utility shortcut icon (Figure 2-5) will appear on your desktop.

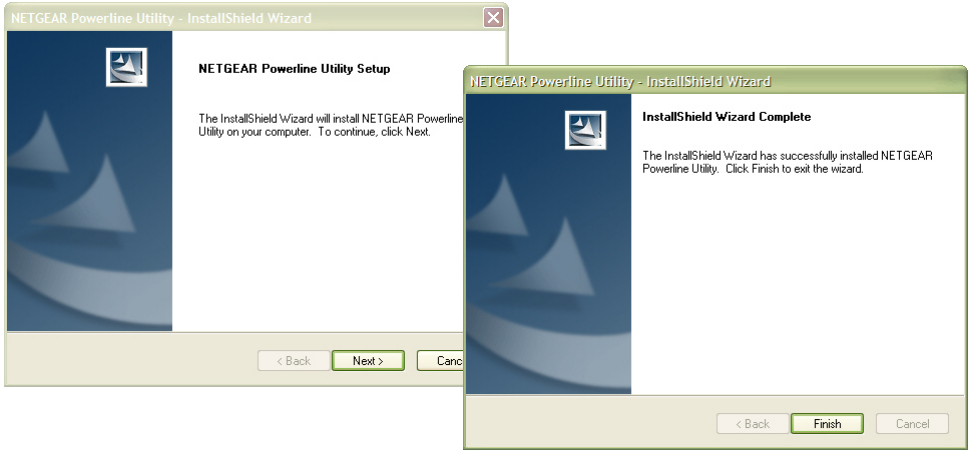

NETGEAR Powerline Utility - InstallShield Wizard
NETGEAR Powerline Utility Setup
The InstallShield Wizard will install NETGEAR Powerline Utility on your computer. To continue, click Next.
< Back
Next >
Canc
NETGEAR Powerline Utility - InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed NETGEAR Powerline Utility. Click Finish to exit the wizard.
< Back
Finish
Cancel

Figure 2-4

5. There are two ways to launch the NETGEAR Powerline Utility:
   - Click the NETGEAR Powerline Utility shortcut icon located on your desktop.
   - Navigate to **Start > Programs > NETGEAR > NETGEAR Powerline Utility**.

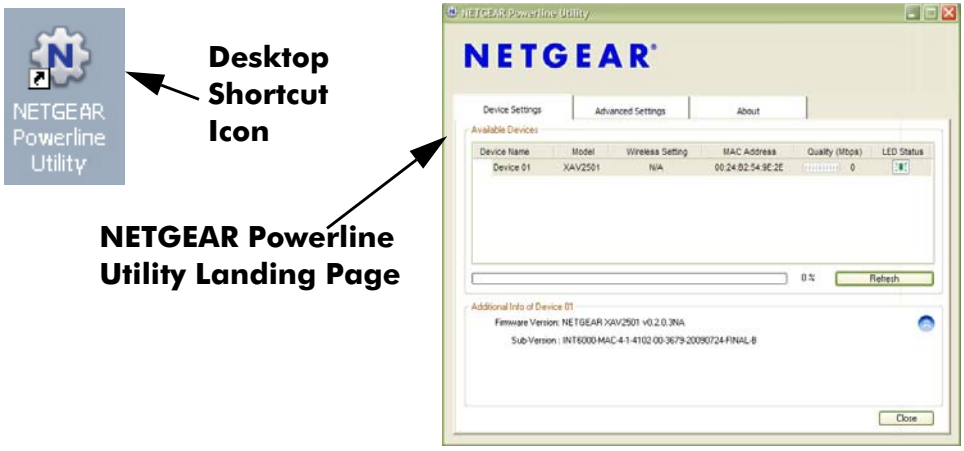


Figure 2-5

Device Settings Tab

When launched, the NETGEAR Powerline Utility opens to the Device Settings tab. Click the Refresh button to perform a scan of your network devices.

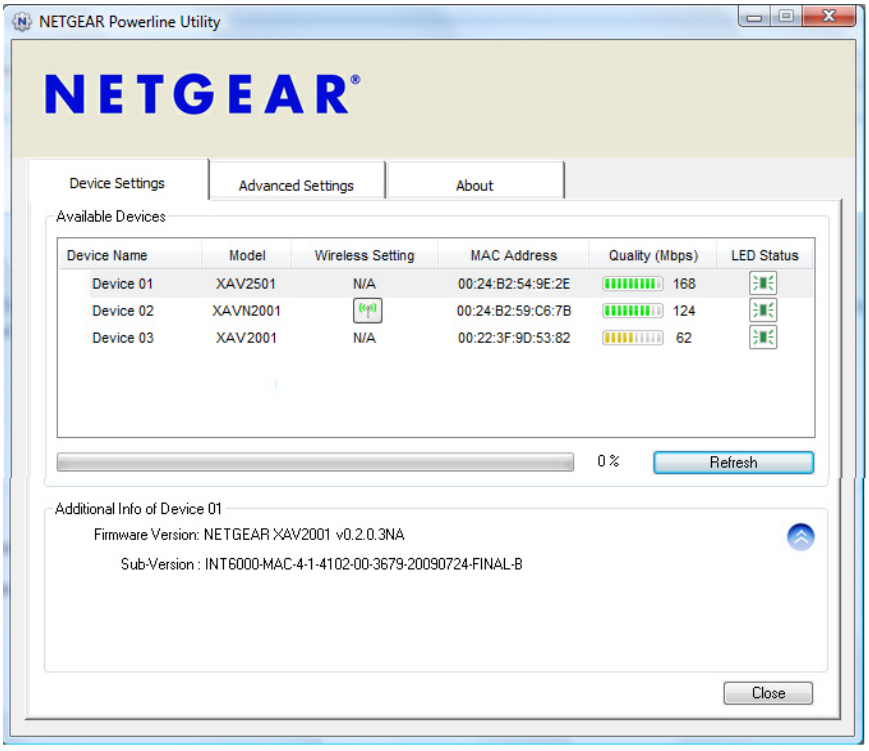


Figure 2-6

Note: You may see a message at the bottom of the screen regarding the power saving feature. If the unit goes into power saving mode, the NETGEAR Powerline Utility will not find it. Keeping an Ethernet cable plugged into the device will keep it active.

The following table describes the features on the **Device Settings** Tab.

Table 2-1. NETGEAR Powerline Utility Device Settings Tab

Field or Button	Description
Device Names	This lists the Powerline devices detected on the network after the utility completes a scan for devices. The device name is initially set by the utility, but can be changed to reflect your specific adapter. For example, “Office” or “Master Bedroom”. NOTE: Device names are stored on your computer, not in the powerline adapters, so, if you use the Powerline Utility on another computer, you will not be able to see the modified devices names on that computer.
Model	This identifies the model number of the Powerline Adapter.
MAC Address	The MAC address for the Powerline device. This is also on the product label, which might not be visible when the device is plugged in.
Quality (Mbps)	This indicates the type of traffic that can be handled smoothly and the link rate for each Powerline device: HD Video, SD/DVD Video, or Data. •HD Video. The device can handle high-definition video traffic smoothly. This status will be shown if the transmit and receive link speed is greater than 80 Mbps. LED will be green. •SD/DVD Video. The transmit and receive link speed is greater than 50 Mbs or less than 80 Mbps. LED will be amber. •Data. The transmit or receive link speed is less than 50 Mbps.Although the device cannot smoothly handle video at this quality level, the device will successfully transmit data. LED will be red.
LED On/Off button	Enable or disable the LEDs for a Powerline device.The LEDs are enabled by default.

Adding a Device to a Powerline Network

If you are adding a device to a Powerline network, and the network encryption key has been left at its default setting, all you need to do is plug the new device into a power outlet.

If the network encryption key has been customized, there are two ways to set the security:

- You can use the Security button to add the new device to your network. See "Adding Adapters to Your Network" on page 1-6.
- You can use the NETGEAR Powerline Utility to add the new device to the network, as described in the following sections.

The procedure for setting the network encryption key depends on whether the computer running the NETGEAR Powerline Utility is connected directly to the new Powerline AV+ 200 Adapter (local) or is connected to a different device in the Powerline network (remote).

To Add a Device from a Locally Connected Computer

1. Plug the new Powerline AV+ 200 Adapter into an available AC power outlet.
2. Connect the Ethernet cable that came with the adapter to the adapter's Ethernet port and an Ethernet port on the computer.
3. Start the NETGEAR Powerline Utility. This displays the **Device Settings** tab. Wait for the utility to detect the new device.
4. Select the Advanced tab, and click the **Security** arrow.
5. From the Device Name column select the device.
6. Type the network encryption key into the **Create a New Encryption Key** field.
7. Click the **Apply Security to Selected Devices** button.
8. Select the **Device Settings** tab to perform a scan.

   Verify that the devices in the Powerline network appear in the device list. It may take a minute or two for all devices in the network to be detected.

To Add a Device from a Remotely Connected Computer

If you are using a custom network encryption key, set all the devices to the default network encryption key of **HomePlugAV** so that they can communicate with each other. Then set all the devices to the network encryption key that you want to use.

1. To change the encryption key for a remote device, you must enter the password for the device. The password is printed on the product label.
2. Click the device name for a remote Powerline device to highlight it in blue.

Note: Be sure to change the password of remote devices before changing it on the local device so that you can maintain connectivity throughout this process.

3. Click **Enter Password.**
4. Enter the device password, and then click **OK**.

   The device password is located on the product label.
5. From the Device Name column, select the device.
6. Type the network encryption key into the **Apply the Encryption Key** field.
7. Click the **Apply Security to Selected Devices** button**.**
8. Select the **Device Settings** tab. This will perform a automatic scan.

   Verify that the devices in the Powerline network appear in the device list. It may take a minute or two for all devices in the network to be detected.

Security

From the **Advanced Settings** tab on the NETGEAR Powerline Utility you can perform a number of security functions, such as:

- Changing the network encryption key
- Setting up a custom network encryption key
- Returning to the Factory Default Network Encryption Key
- Changing the Network Encryption Key for One Unit at a Time

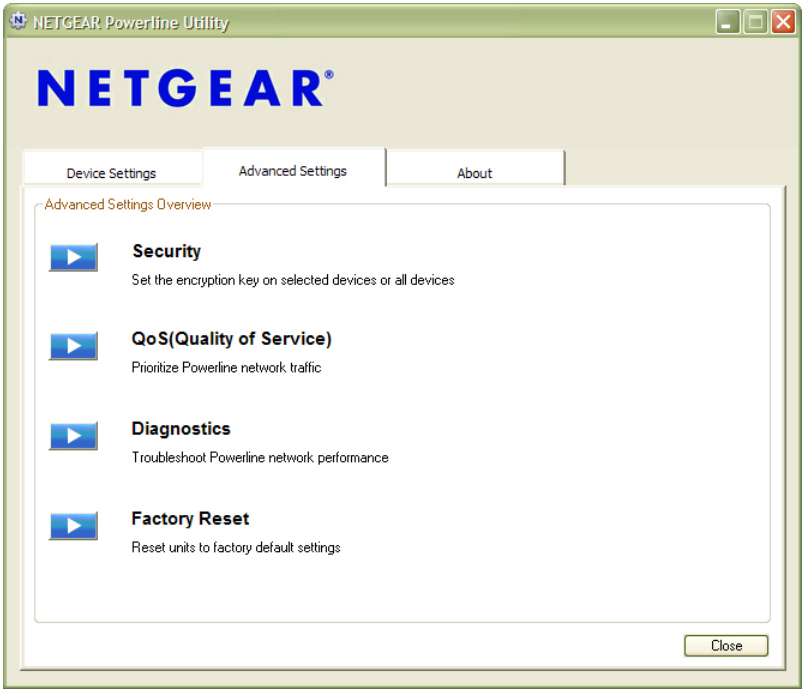


Figure 2-7

Changing the Network Encryption Key

You can specify the network encryption key from the Security tab.

1. From the **Advanced Settings** tab, click the **Security** arrow.

   When all the devices are set to the default network encryption key and are plugged in, they are listed on the **Device Settings** tab.

2. Check each box next to the Device Names that you want to add encryption.

   Here you have two options:

   a. Use the Default Encryption Key option

   When you click this option, the factory default encryption key is automatically populated in the field. The default network encryption key is **HomePlugAV.**

   b. Create your own Encryption Key

   This option lets you set your own network encryption key. Type your network encryption key in the field provide.

3. Apply the changes by clicking the **Apply Security to Selected Devices** button.

   When completed, the utility displays a message indicating that the operation was successful.

   Click **OK**.

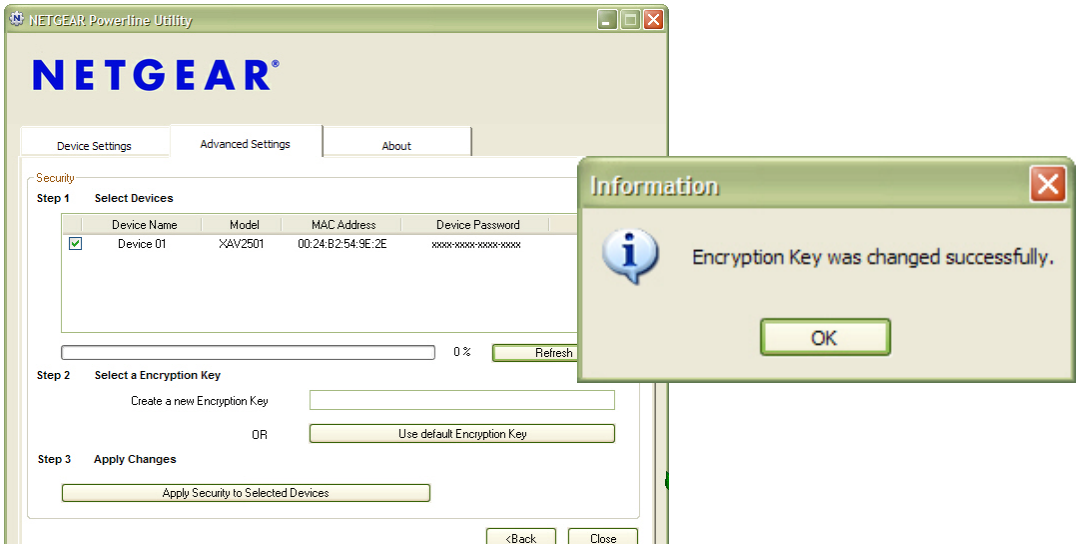


Figure 2-8

Setting Up a Custom Network Encryption Key

When all the devices are set to the default network encryption key and are plugged in, they are listed on the Device Settings tab. Follow these steps to set up a custom network encryption key for all the Powerline devices:

1. Select the **Device Settings** tab to automatically perform a scan.

   Wait for the new device to be listed. A new device can be identified by its MAC address.

2. From the **Advanced Settings** tab, click the **Security** arrow, and check the boxes next to each device in the Device Name column.

3. Type your network encryption key in the **Create a New Encryption Key** field.

4. Click **Apply Security to Selected Devices**.

   The utility displays a message indicating that the operation was successful.

5. Select the **Device Settings** tab to perform a scan.

   Verify that all devices are detected with your network encryption key.

Note: If one or more of your Powerline devices are not listed, see "Quality of Service (QoS)" on page 2-13.

For troubleshooting information, see "Problems After Changing Network Encryption Key" in Appendix B

Returning to the Default Network Encryption Key

1. Plug the new device into an AC power outlet.
2. Start the NETGEAR Powerline Utility
   - Wait for the utility to detect the devices in your Powerline network.
   - Check that all the devices in the established network are displayed on the **Device Settings** tab.

> **Note:** Before you can reset a remote device, you must enter its password. The password is printed on the product label located on the back of the adapter. Once you enter the correct password, the computer will memorize it so, thereafter, you will not need to enter the password again when you want to change the configuration of the powerline adapter.

3. From the **Advanced Settings** tab, click the **Security** arrow, and from the Device Name column, check the box next to each device you want to set.
4. Click the **Use Default Encryption Key** button.

   You will see the default encryption key, **HomePlugAV,** display in the encryption field.
5. Click **Apply Security to Selected Devices**.

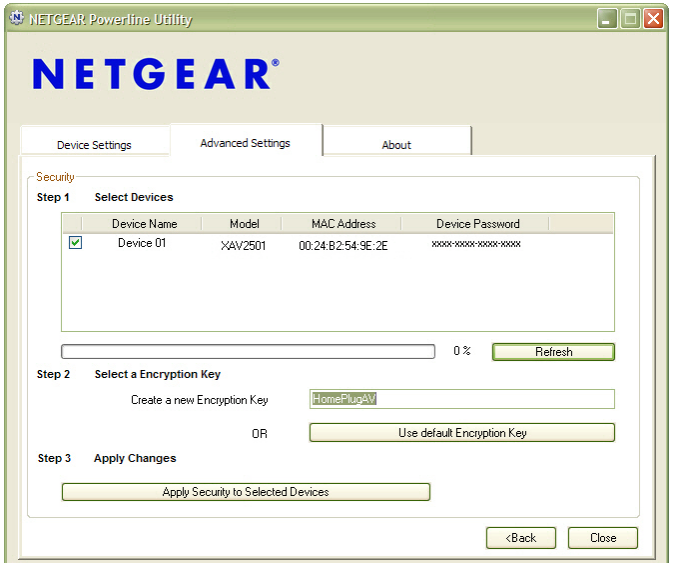


Figure 2-9

Quality of Service (QoS)

From the **Advanced Settings** tab on the NETGEAR Powerline Utility, you can use the QoS tab to help you prioritize your Powerline network traffic.

By default, all types of traffic on the Powerline network are assigned the same priority. For most applications, this works fine. However, there are situations where performance improves if you assign a higher priority to certain types of traffic, such as multimedia files.

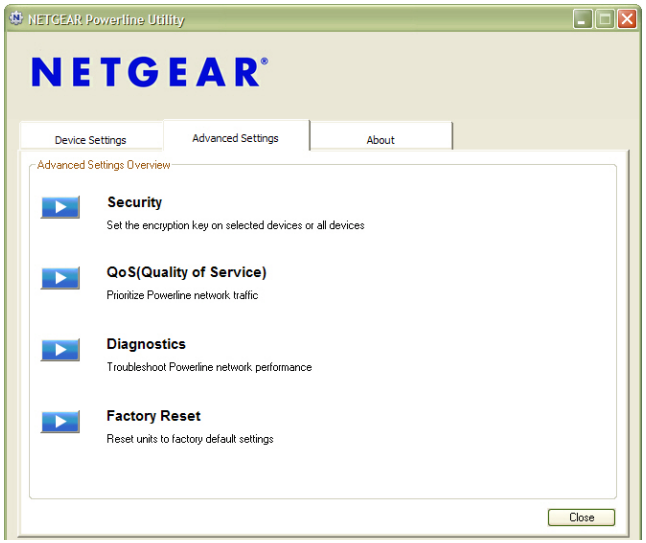


Figure 2-10

Prioritizing by General Application Type

If your network traffic is a mix of multimedia and document/database traffic you might want to give priority to a particular traffic type. If it is important that your multimedia playback is smooth, even while document files are being transferred over the network, then give priority to multimedia traffic. Conversely, if it is more important for your network to be responsive to database applications, give priority to this type of application over multimedia applications.

The Powerline AV+ 200 Adapter supports the following:

- MAC address
- IP port
- VLAN tags
- ToS bits (Type of Service routing)

To set the priority of data transfers by the type of protocol:

1. Start the NETGEAR Powerline Utility and wait for the utility to detect the Powerline AV+ 200 Adapters connected to the network.
2. From the **Advanced Settings** tab, the **Advanced Settings** tab, click the **QoS** arrow.
3. To set the traffic prioritization rule into the selected Powerline AV+ 200 Adapter device, specify the priority in the **QoS Setup** section of the screen.

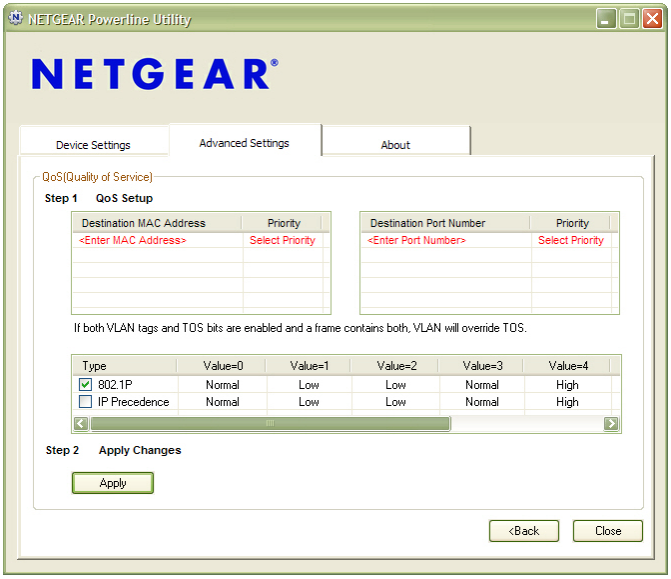


Figure 2-11

4. Click **Apply**.

	Note: QoS settings are applied only to the device that is selected on the QoS tab.

These options only apply to QoS-configured business networks. IEEE 802.1p uses prioritization bits in Layer-2 frames. Type of Service routing (ToS) uses prioritization bits in Layer-3 IP packets. The deprecated ToS values range from 0 to 7.

Diagnostics

From the **Advanced Settings** tab on the NETGEAR Powerline Utility, the Diagnostics tab helps you diagnose and troubleshoot performance issues. Using this feature you can delete a device from the device history, save a report, or print a report.

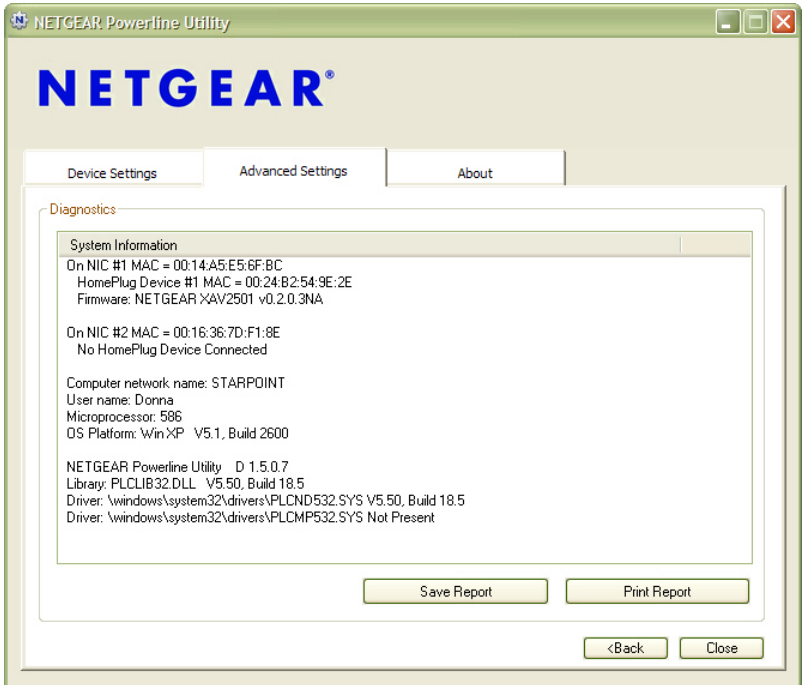


Figure 2-12

Factory Reset

From the **Advanced Settings** tab on the NETGEAR Powerline Utility, the Factory Reset option returns the network encryption key back to its factory default value of **HomePlugAV**, and the QoS status, and LED on/off also revert back to their original default settings. Only one device at a time can be reset.

Resetting to Factory Defaults

1. From the **Advanced Settings** tab, click the **Factory Reset** option and select the Powerline device(s) to be reset.

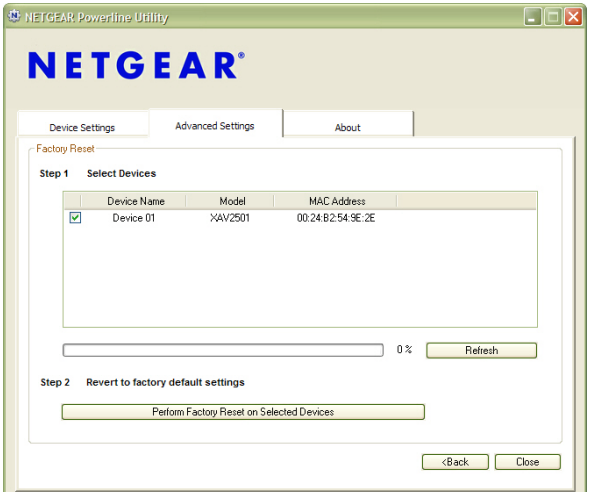


Figure 2-13

2. Click the **Perform Factory Reset on Selected Devices** button**.** A confirmation message displays.
3. Click **OK** to reset the device. A message indicates whether or not the operation succeeded.
4. After you have reset each device, check that the Device Settings tab lists all devices in the network.

	Note: If you customized your network encryption key, the local Powerline device will be disconnected from the network when you reset it to the factory default. To avoid this problem, reset all remote devices before you reset the local device.

Appendix A
Technical Specifications

This appendix provides technical specifications for the XAV2501 Powerline AV Ethernet Adapter.

Network Protocol and Standards Compatibility	
Data and Routing Protocols:	IEEE 802.3 (10BASE-T), IEEE 802.3u (100BASE-Tx)
AC Input:	100-240V~, 0.2A (Max)
Power Consumption:	Normal: 4W Power Saving Mode: 3W
Dimensions:	Height: 138 mm Width: 65 mm Depth: 40 mm
Weight:	0.56 lbs (0.25 kg)
Socket ratings:	EU: 15A 250V~ NA: 14A 125V~ UK: 12A 250V~
Environmental Specifications	
Operating temperature:	0° to 40° C (32º to 104º F)
Operating humidity:	10-90% maximum relative humidity, noncondensing
Storage humidity:	5-95% maximum relative humidity, noncondensing
Security Encryption type:	128-bit AES
Bridge Performance	
MAC addresses:	64 - number of nodes that can be added to a single network
Bandwidth:	200 Mbps
Powerline Performance	
Compatibility:	Not HomePlug v1.0 or HomePlug v1.0 Turbo compatible
Data Transfer Rate:	Up to 200 Mbps with real throughput greater than 80 Mbps
Frequency band:	2-30 Mbps
Modulation type:	OFDM symbol modulation
Meets Requirements	
Electromagnetic Emissions:	FCC Part 15 Class B; CE-EMC Class B; 3-home FCC Certificate
Safety Agency Approvals:	UL Listed (UL 1950) /cUL IEC950; CE LVD; TUV CB, TUV CG

Safety Information: XAV2501 Powerline AV+ 200 Adapter

Follow these safety guidelines to ensure your own personal safety and to help protect your system from potential damage.

- AC input: 100-240V~, 0.2A (Max)
- Operating temperature: 0C~40C

The socket-outlet shall be installed near the equipment and shall be easily accessible.

- XAV2501 product ratings (maximum load):
  - EU: 15A 250V~
  - NA: 14A 125V~
  - UK: 12A 250V~
- Only power cords are allowed to be inserted into the filtered AC outlet; no other equipment with a direct plug-in is allowed. Power cord needs to be a maximum of 1m long and a minimum of 0.75mm square of cross-sectional area.
- Do not plug devices into the XAV2501 filtered AC outlet that exceed the product ratings.The output voltage of the filtered AC outlet is the same as the power outlet which the XAV2501 is plugged into. To help avoid damaging your system, be sure that the attached devices are electrically rated to operate with the power available in your location.
- DO NOT PLUG MAJOR HOME APPLIANCES into the filtered AC socket or into an attached power strip. The device is not intended to be used with home appliances such as air conditioners, power tools, space heaters, fans, hair dryers, ovens, refrigerators, and the like. • Check the electrical current for any appliance used with the device, and do not exceed home and product outlet ratings and electrical requirements.
- Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.
- Observe and follow service markings.
- Do not service any product except as explained in your system documentation.
- Opening or removing covers that are marked with the triangular symbol with a lightning bolt may expose you to electrical shock. Only a trained service technician should service components inside these compartments.

- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
  - The power cable, extension cable, or plug is damaged.
  - An object has fallen into the product.
  - The product has been exposed to water.
  - The product has been dropped or damaged.
  - The product does not operate correctly when you follow the operating instructions.
- Keep your system away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- Allow the product to cool before removing covers or touching internal components.
- To help avoid damaging your system, be sure that the voltage selection switch (if provided) on the power supply is set to match the power available at your location:
  - 110 volts (V), 60 hertz (Hz) in most of North and South America and some Far Eastern countries such as South Korea and Taiwan
  - 100 V, 50 Hz in eastern Japan and 100 V, 60 Hz in western Japan
  - 230 V, 50 Hz in most of Europe, the Middle East, and the Far East
- Be sure that attached devices are electrically rated to operate with the power available in your location.
- To help prevent electric shock, plug the XAV2501 Powerline AV+ 200 Adapter into properly grounded electrical outlets.
- Use only approved power cables. If you have not been provided with a power cable for your system or for any AC powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.
- Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.

- Position system cables and power cables carefully; route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications.
- Always follow your local and national wiring rules.

Appendix B
Troubleshooting

This chapter provides information about troubleshooting your XAV2501 Powerline AV+ 200 Adapter.

Product Registration and Support

Thank you for selecting NETGEAR products.

After installing your device, locate the serial number on the label of your product and use it to register your product at http://www.NETGEAR.com/register. Registration is required before you can use our telephone support service. Registration via our website is strongly recommended.

The *Resource CD* provides a listing of the regional customer support information, and product updates and web support are available at: http://www.netgear.com/support.

Basic Functioning

After you turn on power to the XAV2501 devices, the following sequence of events should occur:

1. When power is first applied, verify that the Power light is on.
2. After approximately 10 seconds, verify that:
    a. The power light is solid green.
    b. The Powerline LED is lit.
    c. The Ethernet light on the Powerline AV+ 200 Adapter lights or blinks

LED Troubleshooting Tips

Table B-1. LED and Feature Troubleshooting

Problem	Recommendation
Power light is off.	Make sure that power is supplied to the electrical outlet, and the Powerline device is not plugged into an extension cord, power strip, or surge protector.
Power LED is amber.	The adapter enters power saving mode if the Ethernet port is not linked for more than 10 minutes. It goes back to normal mode when the Ethernet port is linked.
Powerline light is off.	Powerline devices cannot find each other. Make sure that the Powerline devices are plugged into outlets with power, and that they use the same network encryption key. • Move the Powerline device to a location closer to the computer or devices. • If you have set up network security, make sure that all Powerline devices are using the same encryption key; see the online *User Manual* for details. • If the problem occurred after you changed the network encryption key, reset each device to their factory default settings. If this fixes the problem, see the *User Manual* for instructions about setting the network encryption key.
Ethernet light is not blinking.	There is no data traffic. Make sure that: • Your router and modem are switched on. • The Ethernet cable that came in the box are working and securely connected to the Powerline adapter port and a router LAN port. • The PC connected directly to the router can access the Internet. • Press the Reset button on each device for 1 second to return the Powerline adapter to its factory default settings
Problem using the Reset or Security button.	The Reset and Security buttons are located on the side panel of the Powerline AV+ 200 Adapter. • Pressing the reset button longer than 2 seconds will not reset the device. • Pressing the Security button longer than 2 seconds will not activate security. • See the *User Manual* for instructions on using the Reset and Security buttons.
All LEDs are off when plugged into the AC line.	• check the NETGEAR Powerline Utility, if see if the LEDs are turned via the software. If so, then use the utility to turn them back on.

Problems After Changing Network Encryption Key

.If your Powerline devices stop communicating after you have used the NETGEAR Powerline Utility you'll need to change the network encryption key.

To change the network encryption key:

1. Open the NETGEAR Powerline Utility and select the Security option on the **Advanced** tab.
2. Select the device.

   For each remote device, enter its password (printed on the product label), and then select it.

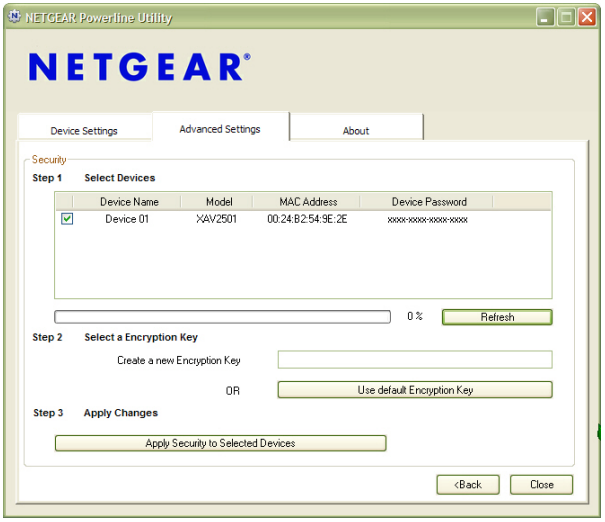


Figure B-1

3. Click the **Use Default Encryption Key** button.
4. Click the **Apply Security to Selected Devices** button.
5. Select the **Device Settings** tab, and check that the utility detects all the Powerline AV+ 200 Adapters in your Powerline network.

   If the utility detects all your Powerline devices, you can specify a new network encryption key as described in "Adding a Device to a Powerline Network" in Chapter 2.

   If the utility does not detect them all, see the following section, "Changing the Network Encryption Key for One Unit at a Time.

Changing the Network Encryption Key for One Unit at a Time

If the NETGEAR Powerline Utility does not detect all the devices in your network, you must connect your computer to each Powerline device and set up the network encryption key one adapter at a time, as follows:

1. From the **Advanced Settings** tab, click the **Security** arrow.
2. Select the first Powerline adapter in your network.
3. In the **Select an Encryption Key area,** type the network encryption key that you want to assign to the adapter in the **Create a new Encryption** field.
4. Click the **Apply Security to Selected Devices** button.
5. Repeat for each device in the network.
6. Select the **Device Settings** tab to automatically scan for Powerline Devices.

   Check that the utility detects all the devices that have been individually set to the same network encryption key.

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